

## **REMARKS/ARGUMENTS**

Claims 11 – 16 and 22 – 25 remain in the application subject to examination

Claims 1 – 10 and 17 – 21 have been cancelled

Claims 11 and 14 were rejected under 35 USC §103(a) as being unpatentable over Applicants' own specification in view of U.S. Patent No 5,292,780 to C.G. Godfrey et al.

Claims 12, 13, 15, and 16 were rejected under 35 USC §103(a) as being unpatentable over Applicants' own specification in view of Godfrey et al and in further view of U.S. Patent No. 5,938,878 to R.F. Hurley et al.

Claims 22 – 24 were rejected under 35 USC §103(a) as being unpatentable over Applicants' own specification in view of Godfrey et al and in further view of U.S. Patent No. 6,971,193 to D.R. Potter et al.

Claim 25 was rejected under 35 USC §103(a) as being unpatentable over applicant's own specification in view of Godfrey et al, Potter et al and further in view of Japanese Patent Application No. 08-188418 (Publication No. 10-007833) to K. Shigeo et al.

Applicants' claimed invention is a "new and useful ....process" as defined by 35 USC §101. Specifically, applicants' invention relates to a method of transforming an open-cell, polyvinylidene fluoride (PVDF) foam to a consolidated elastomer product. Typically, the product of Applicants' invention has rubber-like properties such as a Shore A Durometer of about 60 to 90 and 1500% elongation. A more expansive listing of the physical properties demonstrated by Applicants' elastomer product is presented in specification paragraph [0029] on page 10 of the specification. The raw starting material of Applicants' transformation method, as claimed, is a product blank of open-cell, PVDF foam. PVDF foam is a material having 70% to 90% porosity and high permeability. The PVDF foam known to the trade as ULTRAFLEX ® is representative. Specification paragraph [0025].

Pursuant to Applicants' method, a product blank of the ULTRAFLEX ® foam, such as a ring gasket, is compressed in a heated molding press at about 300°F - 350°F. The compression ratio is about 5 to 7:1. This compressed, heated state is held for a time period sufficient to displace substantially all of the air from the foam

cell spaces. Under such conditions of heat and pressure, the foam transforms to a stable, consolidated, translucent mass having the above said elastomeric properties.

"Typical ULTRAFLEX® porosity provides a product volume that is about 12% material substance and 88% air. When compressed under heat and pressure, substantially 100% of the air is displaced and the material substance **consolidates** into a **monolithic** elastomer having a Shore A Durometer of about 60 to 90." Specification ¶ [0028].

Applicants' independent claim 11 is directed to the above method of forming a **consolidated** PVDF elastomer product comprising steps that include: (a) forming a product **blank profile from a PVDF foam**, (b) placing the blank in a heated molding press, (c) compressing the blank by a ratio 5:1 to 7:1 while heating the blank to between 300°F and 350°F and (d) holding the heat and pressure on the blank for a time sufficient of **displace substantially all air from the PVDF foam**.

More simply stated, applicants' invention is a method of forming a consolidated product from PVDF foam that when transformed is **no longer a foam** but is a consolidated elastomer suitable for use as a gasket in **ultra-pure water systems**.

Applicants' independent claim 14 is directed to "A method of manufacturing a sealing element for fluid system joints". Applicants' independent claim 22 describes the same invention as "A method of forming a monolithic PVDF elastomer."

The disclosure of U.S. Patent No. 5,292,780 to C.G. **Godfrey et al** is directed to a material composition suitable for friction elements such as brake linings and clutch facings. Godfrey et al column 1, lines 8 – 10. The Godfrey et al composition comprises a mixture of fibrous friction material such as asbestos, glass wool or Kevlar® in a binder of polyvinyl alkyl ether and phenolic resin. The mixture is cured under heat and pressure. Godfrey et al column 3, lines 23 – 40. A foamed material has no place in the Godfrey et al composition, as a starting material or otherwise. By no stretch of the **definition of elastomer** may the Godfrey et al brake lining product be considered an elastomer as claimed by Applicants'.

The **Hurley et al** patent discloses a method of fabricating a structural packaging product comprising the lamination of high density and low density polymer

foam sheets. The Hurley et al process begins with two or more individual foam sheets and ends with a single, laminated composite of the several foam sheet layers.

None of the Hurley et al foam sheets are materially transformed. They are simply laminated together. **No gas is displaced from the foam cells.** Each of the foam sheets in the Hurley et composite remains a foam sheet.

The **D.R. Potter et al** patent describes a footwear article having shock absorbing bladders in the sole. The Potter et al bladders comprise a cell of gas such as nitrogen enclosed by a resilient barrier sheet of thermoplastic elastomer. Potter et al describe numerous thermoplastic elastomer materials including "polyurethane, polyester, polyester polyurethane, polyether polyurethane, such as cast or extruded ester-based polyurethane film." Potter et al column 5, lines 37-41. Potter et al continue to name other suitable membrane materials such as PVDC, also known as SURAN, nylon, EVOH and PVDF, also known as KYNAR. Potter et al column 5, lines 53-54. Potter et al disclose nothing about the productive origin of such designated materials.

The Japanese patent to **Shigeo et al** is referenced to the rejection of Applicants' claim 25 as prior art for carrying "out a method wherein said foam is transformed to an elastomer having an elongation property of 1429% to 1869%". The first sentence of the Shigeo et al Abstract states: "A continuous sheet-shaped and crosslinked fluororesin **foam (X) is prepared** by crosslinking and foaming a poly(vinylidene fluoride)(PVDF) mixture consisting of ..." Clearly, the material transformation process disclosed by Shigeo et al is that of forming sheet foam from PVDF resin. PVDF foam is the Shigeo et al end product; not the starting material.

The prior rejection rationale seems to be predicated on a **mischaracterization of Applicant's specification paragraph [0025] and [0026]**. The rejection of claim 11 begins with the allegation that

"the instant specification shows that it is '**characteristic**' and '**traditional**' to carry out a method of forming a PVDF article (para 0025-0026), comprising the steps of forming a product blank profile from a PVDF foam (para 0025); placing

said product blank in a mold between platens of a heated molding process (0026); volumetrically compressing said product blank between said platens(0026); and holding the compressed and heated product for a time (para 0026)."

Respectfully, Applicants' specification shows nothing resembling the Examiner's allegation. Applicant's paragraph [0024] introduces "The raw material of the present invention" as a "proprietary foamed polyvinylidene fluoride (PVDF) material ... marketed as ULTRAFLEX®. The precursor of ULTRAFLEX® is ... Kynar®." Applicants' paragraph [0025] proceeds to describe **relevant properties of ULTRAFLEX® PVDF foam** as being "**characteristics**" of the material. Except for the generalized process property of being "thermoformable", there is nothing in paragraph [0025] that suggests any other process function of or with the material. No suggestion of a process comprising compression of ULTRAFLEX® PVDF foam between heated platens is to be found within Applicants' paragraph [0025].

Applicant's specification paragraph [0026] describes the equipment used to carry out the invention process pursuant to the production of specific products i.e. gaskets or O-rings. This equipment is described as "a **traditional** elastomer curing/molding press having electronic or oil heated compression platens." Applicant's **paragraph [0026] does not say** that it is traditional to compress PVDF foam until it transforms to a consolidated elastomer or until substantially all of the gas is displaced from the open-cell foam:

The Godfrey et al process of compressing a mixture of polymer and fibrous materials to make brake lining material has absolutely no operative relevance to the present invention. The properties of brake liner material are as remote from the properties of Applicants' claimed composition of matter as steel differs from rubber. Godfrey et al is totally non-analogous to Applicant's claimed invention. The first step of Applicants' material transformation process includes a PVDF foam. How the prior art may have processed some other material for other products is totally irrelevant to the patentability of Applicants' invention of compressing and heating PVDF foam.

The Hurley et al disclosure of laminating polymer foam sheets of different

densities is also irrelevant and non-analogous. Hurley et al have **NOT** taught the compression of PVDF foam and have **NOT** suggested the displacement of all gas from foam cells or transformation of the material to a consolidated elastomer.

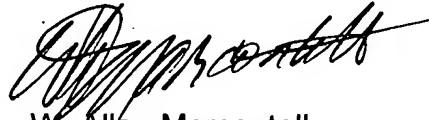
The rejection rational of Applicants' claims 22-24 attributes to Potter et al the disclosure of a "method including molding a foam to form a consolidated elastomer having a Shore A Durometer of about 60 to 90 (Column 5, lines 40-41, 51-54)" Respectfully, Applicants' find **no reference to foams** of any composition in column 5 of Potter et al. The Potter et al material description is directed to polymer **film**. Applicants' invention is not concerned with polymer **film**. Applicants' claims 22-24 are expressly directed to the transformation of **PVDF foam**.

Applicants' invention as described by claims 11 – 16 and 22 – 25 was rejected under 35 USC §103(a) as unpatentable over a combination of diverse and substantially unrelated patent disclosures that fail to disclose anything even similar to the claimed starting material or the transformation product. The rejection purports to justify this **NON-ANALOGOUS PRIOR ART** combination as relying on art drawn from a "similar technical field". Respectfully, the "obvious" standard of 35 USC §103(a) non-patentability requires a "teaching" to combine disclosures from similar technical fields. Federal Circuit case law requires a showing that there is some "suggestion, teaching, or motivation" that would have led a person of ordinary skill in the art to combine the relevant art teachings in the manner claimed. *Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1572 (Fed.Cir, 1996); *In re Dembiczak*, 175 f.3D 994, 999 (Fed Cir. 1999). A bare allegation that prior art is from a "similar technical field" is patently insufficient to justify a 35 USC §103(a) rejection. The fabrication of brake liner material (Godfrey et al) is, categorically, not a similar technical field to the fabrication of ultra-pure gaskets. The fabrication of foam packaging material (Hurley et al) is not a similar technical field to the fabrication of ultra-pure gaskets. The fabrication of cushioned shoe soles (Potter et al) is not a similar technical field to the fabrication of ultra-pure gaskets.

In view of the foregoing amendments and argument, Applicants' respectfully

submit that claims 11 – 16 and 22 – 25 are presently and clearly patentable over the cited prior art. Accordingly, Applicants request the Examiner's favorable reconsideration and allowance of claims 11-16 and 22-25.

Respectfully Submitted,



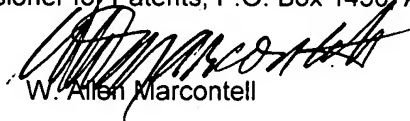
W. Allen Marcontell

Reg. No. 22,925

Date: July 7, 2006

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W. Allen Marcontell